

## Claims

1. A millimetre or sub-millimetre wave illumination system comprising:  
at least one primary radiation source adapted to emit radiation at one or  
5 more wavelengths of interest in at least one radiation field state;  
a baffle comprising a non transmissive surface and having positioned therein  
a plurality of transmissive exit apertures;  
a surface reflective at millimetre or sub-millimetre wavelengths for inducing a  
plurality of radiation paths between the source and the baffle;  
10 characterised in that the system further incorporates means for generating a  
plurality of radiation field states in a pre-determined time interval.
2. An illumination system as claimed in claim 1 wherein the means for  
generating the radiation field state or states is arranged to change the  
15 radiation field state or states within a time shorter than a basic integration  
period of an associated imaging system.
3. An illumination system as claimed in claim 1 or claim 2 wherein the  
baffle and the reflective surface form a part of a container, and the at least  
20 one source is arranged to emit radiation into the container.
4. An illumination system as claimed in any of claims 1 to 3 wherein the  
means for changing the radiation field state or states includes a mechanical  
actuator attached such that it is capable of moving the reflective surface.  
25
5. An illumination system as claimed in any of claims 1 to 3 wherein the  
means for changing the radiation field state or states incorporates a moveable  
structure for disturbing an electromagnetic field between the source and the  
baffle.  
30
6. An illumination system as claimed in claim 5 wherein the moveable  
structure comprises a reflective material.

- 16 -

7. An illumination system as claimed in claim 5 wherein the moveable structure comprises an absorptive material.

8. An illumination system as claimed in claim 8 wherein the moveable  
5 structure comprises a dielectric material.

9. An illumination system as claimed in any of claims 1 to 3 wherein the means for changing the radiation field state or states comprises means for changing the effective point at which the primary source provides an output of  
10 radiation towards the baffle and the reflective surface.

10. An illumination system as claimed in claim 9 wherein the means for changing the effective point at which the primary source provides an output of radiation comprises a primary source output adapted to be moveable with  
15 respect to the reflecting surface and the baffle.

11. An illumination system as claimed in claim 9 wherein the means for changing the effective point at which the primary source provides an output of radiation comprises a switch arranged to switch radiation from the primary  
20 source to one of a plurality of spatially separate outputs.

12. A method of generating millimetre or sub-millimetre wave illumination comprising the steps of:

feeding millimetre or sub-millimetre wave radiation from at least one  
25 primary source towards a reflecting surface and a baffle, the baffle comprising a non transmissive surface and having positioned therein a plurality of transmissive exit apertures, such that the reflecting surface induces a plurality of radiation paths between the source and the baffle;

generating a plurality of radiation field states between the source and  
30 the exit apertures over a pre-determined time interval.